AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions and listings of the claims in the application:

1. (Currently Amended) A method of assigning frame types for coding of pictures in a video sequence, comprising:

computing motion vectors for each of a plurality of pictures following a reference picture, wherein each of the plurality of pictures and the reference picture are part of the video sequence,

determining a motion speed for each picture of the plurality of pictures in temporal order based on the computed motion vectors for each respective picture,

comparing the motion speed of a first picture in the plurality, temporally closest to the reference picture, to the motion speeds of each of the other pictures therein, and

for each picture in the plurality of pictures exhibiting motion speed consistent with the first picture, assigning such pictures as B pictures.

2. (Original) The method of claim 1, further comprising assigning a picture in the sequence that does not exhibit consistent motion speed with the first picture as a P picture.

3. (Previously Presented) The method of claim 1, further comprising:

determining whether a scene change occurs in the plurality of pictures, and, if so:

coding a first picture temporally after the scene change as a P picture, and

coding all pictures in the plurality that occur from the first picture to a picture immediately prior to the scene change as a B picture as long as they exhibit consistent motion speed.

4. (Previously Presented) The method of claim 3, further comprising coding the picture before the scene change as a P picture at full quality or low quality.

5. (Original) The method of claim 1, further comprising coding a picture as a P picture when the picture, if coded as a B picture, would cause a number of consecutive B pictures to be larger than a predetermined maximum.

6. (Original) The method of claim 1, further comprising coding select pictures as I pictures pursuant to a random access policy.

7. (Original) The method of claim 6, further comprising coding a picture temporally adjacent to and before the I picture as a P picture.

8. (Previously Presented) The method of claim 7, further comprising coding a picture temporally adjacent to and before the I picture as a P picture using low quality.

9. (Canceled)

10. (Currently Amended) A video coding method, comprising, from a sequence of video data:

calculating motion vectors for a first picture temporally closest to a reference picture, wherein the reference picture and the first picture temporally closest to the reference picture are part of the sequence;

determining a motion speed of the first picture based on the computed motion vectors for the first picture;

for each picture in the sequence following the first picture, until a termination condition is met:

calculating motion vectors for the respective picture,

determining a motion speed for the respective picture based on the calculated motion vectors for the respective picture,

comparing the motion speed of the respective picture with the motion speed of the first picture, and

coding the respective picture as a B picture if the motion speeds are consistent with each other; and

when the termination condition is met, coding the respective picture as a P picture.

11. (Previously Presented) The video coding method of claim 10, wherein the termination condition is met when motion speed of the respective picture is not consistent with the motion speed of the first picture.

12. (Original) The video coding method of claim 10, wherein the termination condition is met when a scene change is detected.

13. (Original) The video coding method of claim 12, further comprising coding a frame immediately prior to the scene change in display order as a P frame and coding a frame immediately after the scene change in display order as an I frame.

14. (Original) The video coding method of claim 12, further comprising coding frames immediately prior to the scene change in display order and immediately after the scene change P frames.

15. (Original) The video coding method of claim 12, further comprising coding frames immediately adjacent to the scene change in display order as B frames within a group of frames.

16. (Original) The video coding method of claim 12, further comprising detecting a scene change by comparing a correlation coefficient C to a predetermined threshold, the correlation coefficient given by:

$$C(n) = \frac{\sum_{i=1}^{M}\sum_{j=1}^{N} x_n(i,j)x_{n+1}(i,j)}{\sum_{i=1}^{M}\sum_{j=1}^{N} x_n^2(i,j)\sum_{i=1}^{M}\sum_{j=1}^{N} x_{n+1}^2(i,j)}$$, where

n and n+1 identify pictures between which the scene change may be detected, $x_n(i,j)$ and $x_{n+1}(i,j)$ respectively represent pixel values of pictures n and n+1 at pixel locations (i,j) and M and N represent width and height (respectively) of pictures n and n+1.

17. (Original) The video coding method of claim 10,

wherein the termination condition is met when a random access policy dictates that a picture be coded as an I picture, and

a picture temporally adjacent to and before the I picture is coded as a P picture.

18. (Previously Presented) Apparatus, comprising:

a memory to store pictures of a video sequence,

a video coder coupled to the memory, to code each stored picture as one of an I picture, a P picture and a B picture,

a motion vector generator coupled to the memory to generate motion vectors for a plurality of stored pictures,

a colinearity detector having an input coupled to the output of the motion vector generator, the colinearity detector determining a motion speed for each stored picture based on the motion vectors of each stored picture and comparing the motion speed of each stored picture to the motion speed of a first picture after a reference picture, and

a picture type decision unit to assign pictures having generally consistent motion speeds for B picture coding and to assign a picture that does not exhibit consistent motion speed for coding as a P picture.

19. (Original) The apparatus of claim 18, wherein the picture type decision unit further controls the video coder to cause it to code the B and P pictures.

20. (Original) The apparatus of claim 18, wherein the video coder codes B and P frames using motion vectors generated by the motion vector generator.

21. (Original) The apparatus of claim 18, further comprising a scene change detector coupled to the memory and to the picture type decision unit, to identify stored frames that follow a scene change.

22. (Original) The apparatus of claim 21, wherein the picture type decision unit assigns a frame immediately prior to the scene change in display order for coding as a P frame and assigns a frame immediately after the scene change in display order as an I frame.

23. (Original) The apparatus of claim 21, wherein the picture type decision unit assigns a frames immediately prior to the scene change in display order and immediately after the scene change for coding as P frames.

24. (Original) The apparatus of claim 21, wherein the picture type decision unit assigns frames immediately adjacent to the scene change in display order as B frames within a group of frames.

25-28. (Canceled)

29. (Currently Amended) A video coding assignment method, comprising, for each of a plurality of pictures in a sequence of video data following a reference picture in the sequence:

adding a first picture in the sequence that follows the reference picture in display order to a group of frames,

calculating motion vectors for the first picture;

determining a motion speed of the first picture based on the computed motion vectors for the first picture;

iteratively, for pictures subsequent to the first picture in the sequence and in display order:

adding the subsequent picture to the group of frames,

calculating motion vectors for each subsequent picture;

determining a motion speed of the subsequent picture based on the calculated motion vectors for the subsequent picture, if the motion speed of the subsequent picture is consistent with the motion speed of the first picture, performing a next iteration, and if not, coding the last picture of the group of frames as a P picture and coding all other pictures in the group of frames as a B picture.

30. (Canceled)

31. (Previously Presented) The video coding assignment method of claim 29, wherein the motion speed determinations are:

$$S(n,b)=\frac{d_x(n,b)+d_y(n,b)}{n}, \text{ where}$$

S(n,b) represents the motion speed of a pixelblock b of a picture, d_x and d_y represent displacements of the pixelblock b, and n represents the temporal distance of the picture from the reference picture.

32. (Previously Presented) The video coding assignment method of claim 29, wherein consistency of motion speed is based on:

$$E(n)=\sum_{1}^{N_{blocks}}\frac{|e(n,b)|}{N_{blocks}}, \text{ wherein}$$

E(n) represents the mean of the absolute values of the speed errors of a picture, e(n,b) represents a difference of motion vector displacements of a pixelblock b of the picture with respect to the first picture, each scaled according to its temporal distance from the reference

picture, and N_{blocks} represents the number of pixelblocks in the picture.

33. (Currently Amended) A method of assigning frame types for coding of pictures in a video sequence, comprising:

computing motion vectors for each pixelblock of each of a plurality of pictures in the video sequence following a reference picture in the video sequence in temporal order,

determining a motion speed for each pixelblock in the first picture in the plurality, temporally closest to the reference picture, based on the computed motion vectors for the first picture in the plurality

for each picture following the first picture, until a termination condition is met:

determining a motion speed for each pixelblock in the respective picture based on the computed motion vectors for the respective picture,

calculating a motion speed error for the respective picture by comparing the motion speed of each pixelblock in the respective picture with the motion speed of each pixelblock in the first picture, and

coding the respective picture as a B picture if the motion speed error is less than a predetermined threshold,

coding the respective picture as a P picture if the motion speed error is more than a predetermined threshold, wherein the termination condition is met when the respective picture is coded as a P picture.

34. (New) A computer-readable medium encoded with a set of instructions which, when performed by a computer, perform a method of assigning frame types for coding of pictures in a video sequence, said method comprising:

computing motion vectors for each of a plurality of pictures following a reference picture, wherein each of the plurality of pictures and the reference picture are part of the video sequence,

determining a motion speed for each picture of the plurality of pictures in temporal order based on the computed motion vectors for each respective picture,

comparing the motion speed of a first picture in the plurality, temporally closest to the reference picture, to the motion speeds of each of the other pictures therein, and

for each picture in the plurality of pictures exhibiting motion speed consistent with the first picture, assigning such pictures as B pictures.

35. (New) The computer-readable medium of claim 34, wherein the method further comprises assigning a picture in the sequence that does not exhibit consistent motion speed with the first picture as a P picture.

36. (New) The computer-readable medium of claim 34, wherein the method further comprises:

determining whether a scene change occurs in the plurality of pictures, and, if so:

coding a first picture temporally after the scene change as a P picture, and

coding all pictures in the plurality that occur from the first picture to a picture immediately prior to the scene change as a B picture as long as they exhibit consistent motion speed.

37. (New) The computer-readable medium of claim 36, wherein the method further comprises coding the picture before the scene change as a P picture at full quality or low quality.

38. (New) The computer-readable medium of claim 34, wherein the method further comprises coding a picture as a P picture when the picture, if coded as a B picture, would cause a number of consecutive B pictures to be larger than a predetermined maximum.

39. (New) The computer-readable medium of claim 34, wherein the method further comprises coding select pictures as I pictures pursuant to a random access policy.

40. (New) The computer-readable medium of claim 39, wherein the method further comprises coding a picture temporally adjacent to and before the I picture as a P picture.

41. (New) The computer-readable medium of claim 40, wherein the method further comprises coding a picture temporally adjacent to and before the I picture as a P picture using low quality.

42. (New) A computer-readable medium encoded with a set of instructions which, when performed by a computer, perform a video coding method, said method comprising, from a sequence of video data:

calculating motion vectors for a first picture temporally closest to a reference picture, wherein the reference picture and the first picture temporally closest to the reference picture are part of the sequence of video data;

determining a motion speed of the first picture based on the computed motion vectors for the first picture;

for each picture in the sequence following the first picture, until a termination condition is met:

calculating motion vectors for the respective picture,

determining a motion speed for the respective picture based on the calculated motion vectors for the respective picture,

comparing the motion speed of the respective picture with the motion speed of the first picture, and

coding the respective picture as a B picture if the motion speeds are consistent with each other; and

when the termination condition is met, coding the respective picture as a P picture.

43. (New) The computer-readable medium of claim 42, wherein the termination condition is met when motion speed of the respective picture is not consistent with the motion speed of the first picture.

44. (New) The computer-readable medium of claim 42, wherein the termination condition is met when a scene change is detected.

45. (New) The computer-readable medium of claim 44, wherein the method further comprises coding a frame immediately prior to the scene change in display order as a P frame and coding a frame immediately after the scene change in display order as an I frame.

46. (New) The computer-readable medium of claim 44, wherein the method further comprises coding frames immediately prior to the scene change in display order and immediately after the scene change P frames.

47. (New) The computer-readable medium of claim 44, wherein the method further comprises coding frames immediately adjacent to the scene change in display order as B frames within a group of frames.

48. (New) The computer-readable medium of claim 44, wherein the method further comprises detecting a scene change by comparing a correlation coefficient C to a predetermined threshold, the correlation coefficient given by:

$$C(n)=\frac{\sum_{i=1}^{M}\sum_{j=1}^{N}x_n(i,j)x_{n+1}(i,j)}{\sum_{i=1}^{M}\sum_{j=1}^{N}x_n^2(i,j)\sum_{i=1}^{M}\sum_{j=1}^{N}x_{n+1}^2(i,j)}$$, where

n and n+1 identify pictures between which the scene change may be detected, $x_n(i,j)$ and $x_{n+1}(i,j)$ respectively represent pixel values of pictures n and n+1 at pixel locations (i,j) and M and N represent width and height (respectively) of pictures n and n+1.

49. (New) The computer-readable medium of claim 42,
wherein the termination condition is met when a random access policy dictates that a

picture be coded as an I picture, and

a picture temporally adjacent to and before the I picture is coded as a P picture.

50. (New) A computer-readable medium encoded with a set of instructions which, when performed by a computer, perform a video coding assignment method, said method comprising, for each of a plurality of pictures in a sequence of video data following a reference picture in the sequence:

adding a first picture in the sequence that follows the reference picture in display order to a group of frames,

calculating motion vectors for the first picture;

determining a motion speed of the first picture based on the computed motion vectors for the first picture;

iteratively, for pictures subsequent to the first picture in the sequence and in display order:

adding the subsequent picture to the group of frames,

calculating motion vectors for each subsequent picture;

determining a motion speed of the subsequent picture based on the calculated motion vectors for the subsequent picture, if the motion speed of the subsequent picture is consistent with the motion speed of the first picture, performing a next iteration, and if not, coding the last picture of the group of frames as a P picture and coding all other pictures in the group of frames as a B picture.

51. (New) The computer-readable medium of claim 50, wherein the motion speed determinations are:

$S(n,b) = \frac{d_x(n,b) + d_y(n,b)}{n}$, where

S(n,b) represents the motion speed of a pixelblock b of a picture, d_x and d_y represent displacements of the pixelblock b, and n represents the temporal distance of the picture from the reference picture.

52. (New) The computer-readable medium of claim 50, wherein consistency of motion speed is based on:

$E(n) = \sum_{1}^{N_{blocks}} \frac{|e(n,b)|}{N_{blocks}}$, wherein

E(n) represents the mean of the absolute values of the speed errors of a picture, e(n,b) represents a difference of motion vector displacements of a pixelblock b of the picture with respect to the first picture, each scaled according to its temporal distance from the reference picture, and N_{blocks} represents the number of pixelblocks in the picture.

53. (New) A computer-readable medium encoded with a set of instructions which, when performed by a computer, perform a method of assigning frame types for coding of pictures in a video sequence, said method comprising:

computing motion vectors for each pixelblock of each of a plurality of pictures in the video sequence following a reference picture in the video sequence in temporal order,

determining a motion speed for each pixelblock in the first picture in the plurality, temporally closest to the reference picture, based on the computed motion vectors for the first picture in the plurality

for each picture following the first picture, until a termination condition is met:

determining a motion speed for each pixelblock in the respective picture based on the computed motion vectors for the respective picture,

calculating a motion speed error for the respective picture by comparing the motion speed of each pixelblock in the respective picture with the motion speed of each pixelblock in the first picture, and

coding the respective picture as a B picture if the motion speed error is less than a predetermined threshold,

coding the respective picture as a P picture if the motion speed error is more than a predetermined threshold, wherein the termination condition is met when the respective picture is coded as a P picture.